Methodological information from 255 coral heat stress experiments published between 1992 and 2019

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Project
» Coral Bleaching Research Coordination Network (Coral Bleaching RCN)

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Abstract
This dataset includes methodological information from 255 coral heat stress experiments published between 1992 and 2019, compiled from a literature review.

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Coverage

Spatial Extent: **N**:53.1 **E**:166.4333 **S**:-33.8833 **W**:-169.6667
Temporal Extent: 1992 - 2019

Acquisition Description

Literature Search
A literature search was initiated using the ISI Web of Science database and search engine using the following string to identify relevant peer-reviewed publications: Title = coral, Topic = temperature AND bleach*. The initial search returned 1144 publications from 1992 to April 2019. Each publication was examined to assess if the study included the following elements: (1) an experimentally elevated temperature (thus excluding observational surveys conducted after natural bleaching events, and reciprocal transplant/common garden experiments), (2) samples that were either adult corals, planula larvae, or gametes (thus excluding host-tissue explants, ex-hospite and culture-grown Symbiodiniaceae and other microbes), and (3) at least one coral species in the order Scleractinia. The 1144 publications were checked twice to minimize the likelihood of omitting studies which met the above criteria. Two hundred and forty-three publications met all criteria. In some instances, multiple publications were found to report different aspects of the same heat-stress experiment (e.g., Rodrigues & Grottoli, 2006 and

Rodrigues et al. 2008). However, because duplication was often not consistently explicit, all publications were treated as independent experiments to avoid erroneously omitting or merging studies. Similarly, twelve publications (<5%) included descriptions of two or more different experiments. These were divided into separate studies, bringing the total number of heat-stress experiments to 255. The data for this review were collected between April and June 2019.

Data Collection
The collated data were split into three sections and correspond to each goal: (1) temporal, spatial, and taxonomic information, (2) experimental design information, and (3) measured coral response variables. The information collected from each publication reviewed is described in the Supplemental File, Data_Collection.pdf (662 KB).

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Data Files

File	Version
coral_bleaching_exp_methods_data.xlsx (Octet Stream, 275.44 KB) MD5:28fb908104452a4c61c4996685a3679c *Excel file containing methodological information from 255 coral heat stress experiments published between 1992 and 2019, compiled from a literature review. Columns descriptions are provided in a second sheet within the Excel file.*	1

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Related Publications

McLachlan, R. H., Price, J. T., Solomon, S. L., & Grottoli, A. G. (2020). Thirty years of coral heat-stress experiments: a review of methods. Coral Reefs, 39(4), 885–902. doi:10.1007/s00338-020-01931-9
Results

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Parameters

Parameters for this dataset have not yet been identified

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Project Information

Coral Bleaching Research Coordination Network (Coral Bleaching RCN)

Coverage: Columbus, Ohio, USA and Bremen, Germany

Project Summary:
Overview: The goal of the Coral Bleaching Research Coordination Network (Coral Bleaching RCN) is to 1) develop experimental design, sample archiving, and data synthesis protocols, through three workshops and 2) facilitate the formation of interdisciplinary collaborative teams. These goals will be addressed through four activity nodes: workshops, cyberseminars, student and Early Career Training, and RCN activity dissemination. The workshops will be the centerpiece of the Coral Bleaching RCN and focus on three topics: 1) experimental design protocol recommendations, 2) sample archiving protocol

recommendations, and 3) data assimilation protocol recommendations. The results of each workshop will further be presented by a Steering Committee member as a live cyber-seminar. The videos will be archived for future viewing and available to the entire coral bleaching research community. The Early Career Training program will make available, on a competitive basis, funds for 16 individuals to spend time in another lab to learn new skills, methods, or analytical approaches, thus furthering interdisciplinary training. The Coral Bleaching RCN products will be disseminated through a website hosted by Grottoli, publications, cyber-seminar podcasts, postings on coral-list, and hosting sessions at an international conference. The activities of the proposal will be evaluated with post-workshop surveys (and each subsequent workshop will take into account survey findings from the previous workshop), post-early career training surveys, and post-cyber-seminar surveys. The Steering Committee members include two women and one Hispanic with research expertise ranging from geochemistry to ecology, to –omics, and include the following individuals: 1) Andrea Grottoli (RCN Director, Ohio State University), 2) Rebecca Vega Thurber (Oregon State University), Robert van Woesik (Florida Institute of Technology), Mark Warner (University of Delaware), Robert Toonen (University of Hawaii).

Intellectual Merit: Researchers at the recent NSF U.S. Investigator Workshop on Coral Bleaching in 2016 determined that advancing coral bleaching research requires new efficiencies in research and sample archiving methods across a large multi-disciplinary network. By collectively developing common protocols in experimental design, sample archiving, and data assimilation, comparisons among studies, species, and locations are more easily made, and in some cases, experiments would not need to be repeated. An RCN is the ideal platform for developing such protocols, for coordinating multi-PI teams to address coral-bleaching research, and for providing a mechanism for moving the field of coral bleaching forward faster through coordinated efforts. The RCN will also facility new interdisciplinary collaborative coral bleaching research and help train a new generation of coral bleaching scientists to use methods that extend beyond their specific disciplines.

Broader Impacts: Each workshop will consist of 27 participants (5 Steering Committee members, 2 graduate students, 10 invited participants, and 10 selected participants through a competitive application process). This strategy will allow for a large number of individuals to participate in one or more workshop(s). Pre- and post-workshop activities will ensure active participation of all parties. Findings from the workshops will be disseminated through the Coral Bleaching RCN website (hosted by Grottoli), publications, cyber-seminars, conference presentations, and postings to the coral-list. The outcomes of the workshops will help to guide coral bleaching research by enhancing research efficiency, the rate of discovery, the capacity for multi-study comparisons, and stimulating new and unique collaborations. Two graduate students will be involved in the project, and sixteen early career scientists (including the two graduate students) will be awarded funds to learn new interdisciplinary skills in another laboratory. Efforts will be made to select a diverse group of individuals for the workshops and early career program, with representation across gender, race, and country of origin, as well as research expertise (i.e., physiologists, biogeochemists, physical oceanographers, etc). Diversity among career stages will also be considered for workshop participants.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1838667

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